

# Unintended Live Birth versus Abortion: What Factors Affect the Choices of Vietnamese Women and Couples?

*Rising unintended pregnancy and abortion rates are sometimes observed concurrently with rising levels of contraceptive use. However, in transitional societies, such as Viet Nam, where demand for children is falling faster than contraceptive prevalence and use-effectiveness is rising, the widespread use of MR/abortion as a primary means of achieving family size aspirations unnecessarily puts large numbers of women at risk of adverse health outcomes.*

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As the result of a rapid decline recently in fertility levels, Viet Nam has largely completed the transition to low fertility. The total fertility rate (TFR) estimated in the 1999 Census was 2.3 children per woman. Previous demographic

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surveys indicated TFRs of 4.0 in 1987 (Viet Nam Demographic and Health Survey – VNDHS-I), 3.3 for the period 1989-1993 Intercensal Demographic Survey (ICDS 1994), and 2.5 for 1996-1997 Viet Nam Demographic and Health Survey (VNDHS-II). As might be expected, the rapid fertility decline in Viet Nam reflects the significant growth of contraceptive use. VNDHS II data indicate that the all method contraceptive prevalence rate (CPR) had reached 75 per cent by 1997 and the modern method rate 56 per cent.

Despite this, rates of unintended pregnancy and abortion in Viet Nam remain high. A recent analysis of VNDHS II calendar data indicated that 40 per cent of the pregnancies reported by survey respondents during the three years prior to the survey unintended i.e., unwanted or mistimed (Le and others, 2004). When allowance is made for the fact that some pregnancies ending in induced abortion were not likely to be reported by survey respondents, the actual proportion occurring during this period may well approach 50 per cent, a level usually found only in developed countries.

Abortion is legal in Viet Nam, although as in most countries accurate data are unavailable, the evidence indicates that it is widely practiced. It was estimated that the total abortion rate in 1997 was twice that of 1994, e.g. 1.4 abortions during a woman's reproductive life in 1997 compared to only 0.6 abortion in 1994 (National Committee for Population and Family Planning of Vietnam (NCPFP), 1999).

The research reported in this article addressed the question of what factors differentiate Vietnamese women/couples interviewed in the VNDHS II who chose abortion during the 1994-1997 period versus those who chose to carry unintended pregnancies to term. Little is known about the decision-making process of Vietnamese women as to whether or not to terminate unintended pregnancies. The empirical data differs amongst sources. Some authors estimated the total abortion rate in Viet Nam to be 2.5 per 1,000 women of reproductive age (Goodkind, 1994), while other analysis showed the abortion rate was much lower (NCPFP, 1999). It is important for policy and family planning programme purposes to understand the factors behind such decisions in order to develop responsive reproductive health services and programmes.

This paper takes advantage of "calendar" data gathered in the VNDHS II undertaken in 1997 in which female survey respondents were asked to report all pregnancies in the three years prior to the survey, the outcome of each pregnancy and, if terminated, whether the termination was spontaneous or induced. Experience shows that survey respondents, especially in countries where abortion is illegal and/or highly stigmatized, tend to grossly under-report abortions. It is

estimated that only about one third of abortions were reported in the World Fertility Surveys (WFS) undertaken in 40 developing countries (Casterline, 1989). Jones and Forrest (1992) estimated that only 35 per cent of the actual abortions in the four-year period prior to the 1988 United States National Survey of Family Growth (NSFG) were reported in the survey (Jones and Forrest, 1992). However, abortion is legal in Viet Nam and thus, although some abortions undoubtedly went unreported in the VNDHS II, the survey provides one of the better opportunities available to understand the factors underlying decisions by women in a developing country setting to terminate unintended pregnancies or carry them to term as unintended live births.

## **Data and methods**

### **Data**

The VNDHS II used a two-stage cluster sample design. In the first stage of the sample selection a total of 7,150 households, stratified by their urban or rural setting, were selected via systematic-random sampling with probability-proportional-to-estimated-size (PPES). Of those, 7,001 (98 per cent) were successfully interviewed. A total of 5,704 eligible female respondents (i.e., ever-married women) were identified in the household interviews, of which 5,664 (99 per cent) were successfully interviewed. Survey fieldwork took place from July to October 1997. The survey included a household questionnaire, a woman's questionnaire and a community health facility questionnaire. Many questions on current pregnancy status and contraceptive practice were skipped when interviewing formerly married women, who numbered 324 among survey respondents. Thus, the survey was restricted to 5,340 currently married women.

The VNDHS II study takes advantage of "calendar" data gathered in conjunction with the individual questionnaire in which female survey respondents were asked to report retrospectively on a month-by-month basis their pregnancy status, pregnancy outcomes, and contraceptive use (as well as reasons for discontinuation) over a period covering 67-69 months from January 1992 (depending on the month a given interview took place) to 1997. However, information on pregnancy intentions, which is essential to the present paper, was only available for pregnancies that occurred in or after January 1994. Thus, the events analysed in the study were reported to have occurred during the 43-45 month period prior to the survey interview in 1997.

The "intendedness" of pregnancies was measured in the VNDHS II by asking respondents to, for each reported pregnancy, recall their feelings at the time they became pregnant. If a woman reported one or more births since January 1994, the

interviewer asked: “At the time you became pregnant with [child’s name], did you want to become pregnant then, did you want to wait until later, or did you want no (more) children at all?” If a woman was pregnant at the time of the survey, she was asked: “At the time you became pregnant, did you want to become pregnant then, did you want to wait until later, or did you not want to become pregnant at all?” Similarly, if any of her past pregnancies had ended in an induced abortion or menstrual regulation, the interviewer asked: “At the time you became pregnant with the pregnancy which ended in your (last/next-to-last induced abortion/menstrual regulation), did you want to become pregnant then, did you want to wait until later, or did you want no (more) children at all?”. The responses to these questions clarified whether the pregnancy was intended (those answering that “they wanted to become pregnant then”), mistimed (those answering that they “wanted to wait until later”), or unwanted (those who said that “they wanted no more children at all”).

In order to take maximum advantage of the calendar data, the unit of analysis for the study was not the woman, but rather pregnancy and contraceptive use “segments.” A “segment” was defined as a month or a continuous set of months in the reproductive calendar of a woman that satisfied one and only one of the following conditions: (a) one or more months coded as “pregnancy” followed by a “terminated pregnancy” month (the month in which the terminated pregnancy is considered the last month of the pregnancy segment), (b) multiple months coded as “pregnancy” followed by a “live birth” month (the live birth month was considered to be the last month of the pregnancy segment), or (c) a segment with the same code (except the codes for “live births” and “pregnancy”) regardless of length. The latter segment consisted primarily of intervals of successful contraceptive use (defined as those ending either in method discontinuation or in switching to another method while non-pregnant) and intervals of non-use of contraception not resulting in a pregnancy. In short, the authors categorized the events in the reproductive health calendar of the women into three groups: pregnancy events (which did not result in a live birth) which satisfied condition (a) above, live birth events, condition (b), and all other events condition (c). Segments that were truncated or “censored” by the survey interview were classified as censored pregnancy, contraceptive use or non-use segments, respectively. The algorithm used to classify segments is discussed elsewhere such as in Le and others, 2004.

A separate record was created for each of the segments identified in a new data set in which the characteristics of the segment were variables. Characteristics of survey respondents measured in other sections of the VNDHS II questionnaire were attached to those records as additional variables so that possible statistical

associations could be assessed. This restructured data set permitted survey respondents to contribute more than one event to the analysis, reflecting the fact that Vietnamese women contributed differing numbers of events to the countries' demographic history during the period 1994-1997 .

### **Analytic procedures**

Because respondents for the VNDHS II were chosen with differing probabilities of selection, it was necessary to weight the data in order to obtain unbiased estimates for the parameters of interest of the study. Accordingly, all data were weighted by normalized sampling weights, which were calculated as the inverse of the overall probability of selection. Standard errors of population estimates and regression parameters were corrected for the use of cluster sampling in the VNDHS II using the "survey" command in the STATA software package.

Table 1 provides an operational definition of the factors considered in the analysis of correlation of abortion (given that the pregnancy was unintended). Statistical associations were assessed using standard bivariate and multivariate statistical methods. In the multivariate analyses, sequential binary logistic regression models were used to predict the odds that pregnancy segments being terminated (versus resulting in live births), taking into account those independent variables for confounding factor control.

Using segments as the unit of analysis introduces statistical dependency into the analysis as women can and do contribute more than one "segment" of events, and the observations for a given woman may be correlated. Unfortunately, no commercially available computer software that the authors are aware of permits simultaneous adjustment for unequal probabilities of selection, the use of cluster sampling and potentially correlated observations. STATA was used to analyse the segment-based data and no adjustment for dependency was made.

Several other limitations of the study should be noted. Several of these concern the concept of the "intendedness" of pregnancies. One issue concerns recall bias in retrospective survey questions about intention status of pregnancies. A pregnancy might well be classified in the past as unintended, but, at the time of the interview, the woman may have reconsidered and changed her mind and thus responded that it had been an intended pregnancy. Recall bias might also be an issue with regard to other measurements in the survey (e.g., misreporting of timing or sequencing of events).

**Table 1. Operational definitions of the correlates considered in the analysis**

Variable label and explanation	Coding value
<b>A. Socio-economic status index: household characteristics and amenities</b>	
Socio-economic status (low: asset less than 4; middle: asset from 4 to 8; high: more than 8 assets). The 12 assets are: piped water, flush toilet, electricity, radio, TV, refrigerator, bicycle, motorcycle, car, clean floor, concrete proof, telephone.	0= low 1= middle 2= high
<b>B. Demographic characteristics of women</b>	
Region	1= Northern Uplands 2= Red River Delta 3= North Central 4= Central Coast 5= Central Highlands 6= Southeast 7= Mekong River Delta
Age at start of first marriage	0= less than 20 (years) 1= 20 or higher
Woman's occupation	0= agriculture/ not working 1= non-agriculture
<b>C. Husband's background characteristics and influence</b>	
Partner's education level	0= primary or no education 1= secondary and higher
Spousal age difference (husband's age minus wife's age)	0= husband is younger 1= 0 to 3 2= 4 or more
Who decides how to spend money in household	0= wife & husband 1= wife 2= husband 3= other/jointly
<b>D. Past pregnancy issues</b>	
Number of son at the beginning of segment	
Past unintended birth	0= no 1= yes
Past unintended pregnancy termination	0= no 1= yes

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**Table 1. (Continued)**

<b>E. Special variables on the segments of the calendar</b>	
Age of woman at the beginning of segment	0= less than 20 1= 20 – 29 2= 30 – 39 3= 40 +
Pregnancy outcome	0= live birth 1= abortion
Using CM in previous segment	0= no use 1= traditional method 2= modern method
<b>F. Abortion service availability</b>	
Abortion/Menstrual regulation available at Commune Health Station	0= no ; 1= yes
Abortion/Menstrual regulation available at District Health Center	0= no ; 1= yes

Another limitation of the study concerns the cross-sectional nature of the data. Cross-sectional data limits the ability to establish causality, although the retrospective calendar data available in the VNDHS II improves the ability to establish temporal sequencing to some degree. Nevertheless, the available data permit the establishment of statistical associations, but not necessarily of causal relationships.

## Results

### Level of induced abortion

There were a total of 925 pregnancy events classified as “unintended” during the period from January 1994 to the survey interview date in 1997. Virtually all pregnancies ending in abortion were reported as having been unintended. Among 925 unintended pregnancies observed in this study, 475 (51 per cent) were reported as having resulted in live births and 450 (49 per cent) as having been terminated (miscarriage/stillbirths were excluded as intention status was not identified). Of those 450 cases, 63 per cent were reported as having been performed within the first four weeks of pregnancy as “menstrual regulation,” and 37 per cent as having been induced abortions, performed on average 1.7 months after conception. Hereafter, all will be simply referred to as “MR/abortion”. The majority of unwanted pregnancies (65 per cent) reported by respondents during this period were reported to have ended in MR/abortion as compared with only 21 per cent of mistimed pregnancies. The proportion of MR/abortion among women reporting unintended pregnancies was slightly lower than Alan Guttmacher

Institute (AGI) estimate that 56 per cent of unintended pregnancies in developing countries were aborted, versus 73 per cent in developed countries (AGI, 1999). Another recent study has suggested, however, that the proportion of unintended pregnancies that ended in induced abortion in the United States was only 54 per cent (Henshaw, 1998).

Moreover, owing to possible under-reporting of pregnancies ended via induced abortion, it is likely that those figures understate the true prevalence of induced abortion in Viet Nam. Quantifying the level of under-reporting is difficult, but the NCPFP estimated that the actual volume of MR/abortion was probably 2.3 times higher than indicated by a post-enumeration survey conducted in connection with the VNDHS II data (NCPFP, 1999). If this adjustment is accepted, it would suggest that about 68 per cent of unintended pregnancies and 33 per cent of all pregnancies during the 1994-1997 period ended in MR/abortion.

### **Correlations of unintended pregnancy**

To provide a context for the present analysis of how Vietnamese women respond to unintended pregnancies, findings from an analysis of the correlations of unintended pregnancy undertaken using the VNDHS II calendar data that have been reported elsewhere are briefly summarized here (Le and others, 2004). Table 2 presents logistic regression results of the correlations of unintended pregnancy. Unintended pregnancy was found to be associated with a number of factors. Factors associated with a higher likelihood of unintended pregnancies included older age of the respondent, young age at marriage, husbands who were of the same age or older, having one or more living sons, residence in the north and central regions of the country, history of unintended pregnancy, contraceptive use before the pregnancy and less favourable supply environment of contraceptive methods at the district level.

Several of these (older age, young age at marriage, one or more living sons and contraceptive use prior to pregnancy) are likely reflective of, or, associated with preferences not to have additional children. The higher rates of unintended pregnancy in the north and central regions reflect the more limited family planning supply environment found in those parts of the country. The respondents' history of association with unintended pregnancy is noteworthy in that it indicates that Vietnamese women experiencing unintended pregnancies are unable to avert future unintended pregnancies in sizeable numbers. Finally, the association with the husband's age might be indicative of gender power differences within marriage in which older men have greater say over pregnancy than men who are younger than their wife.



**Table 2. Odds ratio for predictors in Logistic Regression Model of pregnancy intendedness**

*(Comparing unintended pregnancies to intended pregnancies)*

Variable name	Odds Ratio	Standard error	t	P	95 per cent Conf. Interval	
<b>Geographic region</b>						
Mekong River Delta (r)						
Northern Uplands	3.101065	0.889840	3.94	0.000	1.758135	5.469776
Red River Delta	2.538786	0.748443	3.16	0.002	1.417161	4.548131
North Central	2.362912	0.768249	2.64	0.009	1.242210	4.494694
Central Coast	3.443489	1.205852	3.53	0.001	1.722766	6.882898
South-East	1.304270	0.489921	0.71	0.481	0.620497	2.741544
<b>Age at start of first marriage</b>						
Less than 20 (r)						
20 or higher	0.659752	0.100740	-2.72	0.007	0.487789	0.892337
<b>Age of the woman</b>						
Less than 20 (r)						
20 - 29	2.748069	0.791524	3.51	0.001	1.554673	4.857538
30 - 39	4.303272	1.306831	4.81	0.000	2.360288	7.845715
40 +	5.677523	3.364874	2.93	0.004	1.758400	18.331590
<b>Spousal age difference</b>						
Less than 0 (r)						
0 to 3	1.687194	0.357122	2.47	0.015	1.110107	2.564278
4 or more	1.718964	0.392347	2.37	0.019	1.094526	2.699651
<b>Had previous unintended birth</b>	6.084181	4.015926	2.74	0.007	1.649209	22.445460
<b>Had previous abortion following unintended pregnancy</b>	7.998987	3.985811	4.17	0.000	2.985752	21.429710
<b>Using CM in previous segment</b>						
No use (r)						
Traditional method	4.657571	1.496571	4.79	0.000	2.467047	8.793090
Modern method	4.800198	1.607249	4.68	0.000	2.475561	9.307748
<b>Number of son alive</b>	2.750352	0.342116	8.13	0.000	2.150550	3.517442
<b>Supply environment at DHC</b>	0.709840	0.088951	-2.73	0.007	0.554027	0.909473

r: reference category

N=1,557

Model fit: F statistic = 11.32 , p<0.001.

### **Unwanted versus wanted pregnancy**

Logistic regression analysis was also performed on desirable pregnancy status as an outcome and the previously mentioned sets of variables as predictors. As described above, desirable pregnancies included all situations in which the woman said she wanted the pregnancy then, or wanted it at a later time (mistimed). Seven independent variables regarding demographic background of the women and their partners and one variable related to the supply of family planning services predicted unwanted pregnancy outcome with significant proximity. Having had an unwanted pregnancy in the past, respondents' geographic region, and use of contraceptive method prior to the current pregnancy were the strongest predictors of an unwanted pregnancy. After establishing controls for other variables in the model, having a previous unwanted pregnancy still increases the risk of a latter unwanted pregnancy by 18 times (95 per cent CI: 6.35 – 51.96,  $p < 0.001$ ). Women of the Northern Uplands and the Red River Delta both show risks of unwanted pregnancy about six times higher than segments from the reference region (Mekong River Delta,  $p < 0.01$ ). The Central Coast Region also has a risk approximately four times higher than the reference region ( $p = 0.033$ ). Compared to the reference age group of women under 20, the risk for women aged 30-39 is 10.3 times higher ( $p < 0.05$ ), and for women over 40 it is 11.4 times higher. The risk of an unwanted pregnancy is not associated with age at first marriage, as is the case in unintended pregnancy. Spousal age difference is still a significant predictor of unwanted pregnancy, however. Women whose husbands are at the same age or older are about two times more likely to have pregnancies declared as unwanted ( $p < 0.05$ ).

The number of living sons and daughters is also highly significant in predicting the outcome of an unwanted pregnancy. Having one living son at the time the segment occurred increases the risk of unwanted pregnancy by about 5.4 times ( $p < 0.001$ ), while having one living daughter only increases the risk by 2.4 times ( $p < 0.001$ ). Concerning the availability of family planning methods, analysis shows no increase in availability of contraceptive methods significantly reduce the risk of unwanted pregnancy outcomes. However, the availability of intrauterine devices (IUDs) at the "commune health stations", at the level of  $p = 0.03$ , turned out to be a significant factor in guarding against unwanted pregnancy. The risk of an unwanted pregnancy for those who lived in the cluster in which the IUD service was available at the local health station was approximately 50 per cent lower than for those who lived in a commune without IUD service.

### Correlations of choice for an induced abortion

In the event that Vietnamese women experience an unintended pregnancy, what factors distinguish women who seek abortion services from those who go on to deliver an unintended live birth? Table 3 presents summary findings from bivariate analyses focusing on this question.

**Table 3. Summary of bivariate results**

*(Comparing percentage of abortion versus live births among predicting variables)*

Variable	Live birth	Abortion
<b>Geographic region (N=924)*</b>		
Northern Uplands (N=303)	34.0	66.0
Red River Delta (N=220)	35.0	65.0
North Central (N=119)	76.5	23.5
Central Coast (N=93)	98.9	1.1
Central highlands (N=21)	90.5	9.5
Southeast (N=68)	55.9	44.1
Mekong River Delta (N=100)	55.0	45.0
<b>Socio-economic status (N=924)*</b>		
Low (N=354)	58.5	41.5
Middle (N=524)	48.5	51.5
High (N=46)	30.4	69.6
<b>Age of the woman (N=924)*</b>		
less than 20 (N=53)	86.8	13.2
20 - 29 (N=436)	61.2	38.8
30 - 39 (N=374)	38.5	61.5
40 + (N=62)	29.0	71.0
<b>Religion of woman (N=925)*</b>		
No religion (N=763)	46.7	53.3
Buddhist (N=92)	69.6	30.4
Other (N=70)	78.6	21.4
<b>Husband's educational level (N=925)*</b>		
Primary or less (N=232)	61.6	38.4
Secondary and higher (N=693)	47.9	52.1

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**Table 3. (Continued)**

Variable	Live birth	Abortion
<b>Had previous abortion following unintended pregnancy (N=924)*</b>		
No (N=796)	57.3	42.7
Yes (N=128)	14.8	85.2
<b>Parity (N=904)*</b>	2.8	2.1
<b>Mean number of son alive (N=904)*</b>	1.5	1.0
<b>Using CM in previous segment (N=925)*</b>		
No (N=604)	61.5	38.5
Yes (N=321)	32.4	67.6

\* p<0.001.

Women/couples living in the Northern Uplands Region, the region that previous analyses indicated had extremely high levels of unintended pregnancy, low contraception prevalence and high levels of ineffective contraceptive use (Le and others, 2004), were the most likely to choose induced abortion (66 per cent versus 34 per cent choosing to carry unintended pregnancies to term). Comparable rates of abortion are observed for the Red River Delta region (65 per cent choosing abortion versus 35 per cent carrying to term). These two regions alone accounted for more than 76 per cent of all MR/abortion cases reported in the survey, although they represent just over 40 per cent of the study sample. In all other regions, abortion was chosen by less than 50 per cent of women experiencing unintended pregnancies. Extremely low proportions of abortions are observed in several regions in the central part of the country. No differences by urban/rural setting were observed.

A number of background characteristics are associated with the likelihood of having resorted to MR/abortion. One such factor is age. Women under 20 and between 20-29 years of age were much more likely to have unintended live births (87 and 61 per cent) than to have opted for MR/abortion (13 and 39 per cent, respectively). In contrast, among women aged 30-39, 62 per cent opted for MR/abortion versus only 39 per cent unintended live births; the comparable proportions for women aged 40 and above were 71 per cent choosing MR/abortion and 29 per cent unintended live births. This likely reflects the fact that many older women had already achieved, or exceeded, their family size preferences and were thus more motivated than younger women to avoid additional children. Women reporting "no-religion" were much more likely (53 per cent) than Buddhist women

or women of other religions to have chosen MR/abortion (30 and 21 per cent, respectively).

Recourse to abortion also varied systematically by the socio-economic status of respondents. Women of lower socio-economic background were significantly less likely to have chosen abortion (42 per cent) than either middle- or upper socio-economic status (52 and 70 per cent, respectively).

Only one of three husband characteristics considered showed an association with decisions concerning how to deal with unintended pregnancies. Neither difference in spousal ages, which was associated with the likelihood of unintended pregnancy (women with older husbands were more likely to have experienced an unintended pregnancy) nor husband's occupation were significantly associated with MR/abortion. However, the educational level of the husband did show an association with MR/abortion. Women whose husbands had secondary or higher educations were more likely to have undergone MR/abortion (52 per cent) than women with husbands with lower levels of educational attainment (38 per cent).

The data indicate a clear "son preference" tendency among Vietnamese women and couples. Women who underwent MR/abortion had, on average, 1.5 living sons versus 1.0 living sons among women who decided to have a live birth ( $p < 0.001$ , table 3). The parity were also linked to the MR/abortion decision – women who opted for MR/abortion had an average of 2.8 previous live births versus an average of 2.1 previous births among women deciding to have an unintended live birth ( $p < 0.001$ ). However, the number of living daughters was not linked to the MR/abortion decision, women who opted for MR/abortion had an average of 1.2 living daughters versus an average of 1.1 among women deciding to have an unintended live birth.

Having had a past unintended pregnancy followed by abortion was strongly associated with the decision to undergo MR/abortion in response to unintended pregnancies during the 1994-1997 period. Among the segments with previous history of abortion, in 85 per cent of the cases, the women decided to have an abortion for their current pregnancy during this period, versus only 43 per cent of the segments with no previous pregnancy aborted in the past.

The findings indicate a strong motivation on the part of the women who practice contraceptive methods. Having used contraception was strongly associated with the decision to undergo MR/abortion in response to unintended pregnancies during the 1994-1997 period. Women who did not use any contraception were much more likely to have unintended live births (61.5 per cent) than to have opted for MR/abortion (38.5 per cent). By contrast, among those who

practiced contraceptive methods, 67.6 per cent opted for MR/abortion versus only 32.4 per cent unintended live births.

A number of family planning supply environment indicators were considered in the bivariate analyses, including the overall availability of family planning methods and services, and MR/abortion services specifically, at the community, commune health station and district health center levels. However, none of these indicators showed any association with the likelihood of survey respondents having opted for MR/abortion over unintended live birth.

To assess the net association of the above factors after the effects of the other factors are controlled for statistically, logistic regression was undertaken. The results are displayed in table 4. As can be seen, most of the significant associations observed in the bivariate analyses remained significant after the introduction of statistical controls.

**Table 4. Odds ratios for predictors in logistic regression model of pregnancy outcome comparing abortion to live birth**

Variable name	Odds ratio	Standard error	t	P	95 per cent conf. interval	
<b>Geographic region</b>						
Mekong River Delta (r)						
Northern Uplands	3.286037	2.021174	1.93	0.055	0.973101	11.096520
Red River Delta	1.781520	0.973233	1.06	0.292	0.604479	5.250493
North Central	0.349617	0.250299	-1.47	0.145	0.084806	1.441314
Central Coast	0.011580	0.014090	-3.66	0.000	0.001043	0.128577
Southeast	1.081872	0.647702	0.13	0.896	0.330939	3.536749
<b>Socio-economic status</b>						
Low (r)						
Middle	1.039237	0.322236	0.12	0.901	0.562708	1.919315
High	7.396811	6.793001	2.18	0.031	1.202056	45.516020
<b>Age of the woman</b>						
less than 20 (r)						
20 - 29	1.673852	1.280171	0.67	0.502	0.368594	7.601262
30 - 39	3.411297	2.878548	1.45	0.148	0.642465	18.112950
40 +	7.204601	6.404376	2.22	0.028	1.241044	41.824690
<b>Spousal age difference</b>						
less than 0 (r)						
0 to 3	1.743475	0.587526	1.65	0.101	0.895069	3.396056
4 or more	2.043881	0.745235	1.96	0.052	0.993467	4.204921

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**Table 4. (Continued)**

Variable name	Odds ratio	Standard error	t	P	95 per cent conf. interval	
<b>Partner's educational level</b>						
Primary or no education (r)						
Secondary and higher	2.492579	0.783477	2.91	0.004	1.338326	4.642326
<b>Number of living son</b>	1.460813	0.182781	3.03	0.003	1.140464	1.871146
<b>Had previous unintended pregnancy</b>	6.035786	2.217584	4.89	0.000	2.917666	12.486250
<b>Using CM prior to pregnancy</b>	2.717374	0.598883	4.54	0.000	1.757018	4.202643
r: reference category	N=677				Model fit: F statistic = 6.82 , p<0.001	

The findings confirm the strong association between geographic region and likelihood of pregnancy segments having ended in MR/abortion. Pregnancy segments from women residing in the Northern Uplands were more than three times more likely (odds ratio (OR) = 3.3) to have been terminated than to have resulted in a live birth. Central Coast region women, by contrast, almost always chose to carry unintended pregnancies to term (OR = 0.01).

With regard to the background characteristics of women, age remained strongly related to the MR/abortion decision. Women aged 40 years and above were 7 times more likely than those under age 20 to choose MR/abortion versus an unintended live birth. Religion did not, however, remain significant. Women of high socio-economic status were 7.4 times more likely than women of low socio-economic status to choose to terminate their pregnancies. As in the bivariate analyses, the education and occupation of female respondents was unrelated to the decision as to whether to seek MR/abortion services.

In regard to the husband's characteristics, women whose husband had a secondary or higher level of education were 2.5 times more likely to opt for MR/abortion than women whose husband had no or primary-level education. Spousal age difference, as the bivariate analyses, did not emerge as a significant predictor of MR/abortion in the multivariate analyses. Women whose husbands were four or more years older were two times more likely to choose MR/abortion than women whose husbands were the same age or younger, but this effect was just at the borderline statistically significant level ( $p=0.052$ ).

A history of termination of pregnancies was the strongest predictor of decisions to seek MR/abortion services for subsequent pregnancies (OR=6.0),

indicating a tendency of repeated use of MR/abortion. Women who had one or more sons alive at the time of a given unintended pregnancy were 50 per cent more likely to choose MR/abortion as the solution for the unintended pregnancy.

Interestingly, using any contraceptive method prior to the current pregnancy was strongly associated with the likelihood of seeking an abortion (OR=2.7). This finding corroborates the finding of bivariate analysis. None of the service availability indicators, including those pertaining specifically to MR/abortion services, was associated with the choice of MR/abortion or a live birth, nor was “project/non-project” province status.

### **Discussion**

Several interesting findings on the determinants of unintended pregnancy were found when comparing this study to previous studies conducted in developed as well as developing countries. The most frequently found contributing factors of unintended pregnancy in studies of developed countries were age, age at marriage, marital status, race, income and/or socio-economic status, educational level of the woman and parity. Woelfel, for instance (1991), indicated that unintended pregnancy is more likely to occur among young, never married women who are from the lowest socio-economic group.<sup>13</sup> Young women aged 15-24 were almost twice as likely to report an unintended pregnancy as older women. These authors also revealed that unintended pregnancy varied inversely with a woman’s educational level and income. Studies in the United States of America, United Kingdom of Great Britain and Northern Ireland and other European countries, however, revealed a different direction of association between independent variables and unintended pregnancy (see Woelfel, Walsh and Morse, 1991; Grady, Hayward and Yagi, 1986; Fleissig, 1991; Denton and Scott, 1994). Denton and Scott reported that high parity was a significant determinant of unintended pregnancy, but education, housing, income and maternal age were not significant in the logistic regression model. In Japan, Goto (2002) also found no significant association between the experience of unintended pregnancy and woman’s education, employment and income (Goto and others, 2002). However, according to this author, significant factors associated with unintended pregnancy were the age of the husband being four or more years older (OR = 1.83) than his wife, the age at initiation of sexual intercourse (OR = 1.86) and marriage during teens (OR = 11.14).

The question of age at the initiation of sexual intercourse was not available in the VNDHS survey and the single women were not included in the sample. Therefore, those factors were not analysed in this study. To compensate for lacking



data on the age at first intercourse, this study also elaborated on the age at first marriage or union of the women. The findings of this study showed a highly significant association between unintended pregnancy and age of the woman at the time of conception (which is more similar to Denton's findings) as well as her age at the time she got married (similar to Goto's findings). The risk of unintended pregnancy in Viet Nam is clearly associated with a woman's increasing age. When the women were in the 20-29 age group, they were 2.8 times more likely to declare a pregnancy as unintended than when they were younger than 20. Pregnancies of women aged 30-39 were 4.3 times, and of women over 40 5.7 times more likely to be unintended. Consistent with the findings by Goto, this study also suggested that pregnancy events of those who married during their teens were at least 30 per cent more likely to be unintended. Compared to studies in developing countries, the opposite effect of age was only observed in another study by Eggleston (1999) where giving birth at a relatively older age significantly lowered the probability of unintended pregnancy (Eggleston, 1999).

Spousal age difference was only analysed in one previous study (Goto, 2002). VNDHS 1997 data also suggests such a significant effect on unintended pregnancy among women whose husbands were four or more years older (OR=1.72 versus 1.83 in Japan). However, unlike the findings in Japan, not only those whose husbands were four or more year older, but those whose husbands were at the same age or from one to three years older, also experienced a higher risk of unintended pregnancy compared to those women who were older than their husbands (OR=1.69). These findings might be explained by the fact that men in Viet Nam are less likely to use family planning practices than Japanese men, and that this occurs across all age groups. Additionally, the proportion of condom use and periodic abstinence/ rhythm was higher among the couples in which the husbands were older, while the proportion of using IUDs was slightly lower. Furthermore, 50 per cent of the ineffective use segments (which ended as unintended pregnancies) occurred as the result of using condoms and practicing withdrawal, the methods that required more cooperation from husbands. Thus, it is assumed that in Viet Nam the women whose husbands were younger may have less difficulty in persuading their husbands to use condoms and withdrawal properly than those whose husbands were older.

Menstrual regulation/abortion appears to be commonly used by Vietnamese women and couples in response to unwanted and, to a lesser extent, mistimed pregnancies. As a contraceptive method was reported as having been used prior to only 33 per cent of the unintended pregnancies reported by VNDHS II respondents during the 1994-1997 period and the modern method in only 17 per cent, it would

appear that MR/abortion is being used to avoid unintended births in lieu of contraception by large numbers of Vietnamese women and couples. Further evidence for this conclusion is provided by the relatively high rate of repeat abortions observed in the VNDHS II data – 24 per cent of the pregnancy segments ending in MR/abortion had been preceded by an earlier MR/abortion. Those findings indicate a need for expanded and higher quality family planning services, and in particular post-abortion services, in order to reduce the prevalence of unintended pregnancy in the country. This result fits well with a qualitative study by Truong Thi Xinh (2004) conducted in Ho Chi Minh City, Viet Nam, where half of women were not counseled during the previous abortions, and contraceptives were given without explanation. Women pointed out that the current service was not enough or in-depth and was not meeting their needs (Truong and others, 2004).

A number of factors were found in the present study to be associated with decisions to pursue MR/abortion instead of carrying unintended pregnancies to term. These included geographic region, socio-economic status, age of the pregnant woman, spousal age difference, husband's education, history of induced abortion, and the number of living sons. Some of these factors (e.g., age, number of living sons) reflect life cycle stage factors associated with reduced demand for additional children, and their association with decisions to resort to MR/abortion is not at all unexpected. Others, however, are of interest in that they document the role of cultural factors in decisions as to whether or not terminate pregnancies and/or have clear family planning programme implications.

First, the significance of the husband's characteristics in explaining decisions to seek MR/abortion services suggests a key role of husbands in the decision-making process. More specifically, those women whose spouses were four or more years older and/or had a secondary or higher level of education were significantly more likely to choose MR/abortion than an unintended live birth. This suggests that the social/economic power of the husband may play an important, and perhaps even dominant, role in decisions to terminate unintended pregnancies. Further research is needed in this area to better understand the dynamics of the decision-making process concerning how to deal with unintended pregnancies in Viet Nam. Nevertheless, the findings suggest that such decisions are appropriately labeled as "women/couple" decisions. These findings also indicate that men need to receive greater attention in family planning programme efforts in Viet Nam in order to increase the use of modern contraceptive methods and reduce the incidence of unintended pregnancies that lead to abortions.

Interestingly, the socio-economic status of women was not found in earlier analyses to be a significant predictor of the likelihood of unintended pregnancy

(Marston and Cleland, 2003). However, when faced with an unintended pregnancy, women of high socio-economic status were 8.5 times more likely to opt for MR/abortion than those of low socio-economic status (no difference between low and middle socio-economic status women was observed). One possible reason for this is that there was a greater motivation to avoid unintended pregnancy and live births among women at high socio-economic status compared to those at lower status.

Third, the analyses did not find any significant geographic differences in the availability of MR/abortion services at either the commune or district level, likely reflecting the wide availability of such services in Viet Nam. Despite this, women/couples in different regions of the country characterized by high levels of unintended pregnancy demonstrated quite different propensities to choose MR/induced abortion in response to unintended pregnancies. Other measured characteristics being equal, women/couples from the Northern Uplands region were four times more likely to choose MR/abortion than those in the Mekong River Delta (the reference or comparison category in the logistic regressions), while women/couples in the Central Coast region were almost twice as likely to carry unintended pregnancies to term. This indicates quite different regional perspectives on the merits and perhaps safety of MR/abortion as a response to unintended pregnancy. However, it is also possible that the desire for large family size is also a hidden contributing factor to the intendedness of pregnancy. The analysis based on the segments did not allow for the link between intendedness of pregnancy and the variable of desired family size. However, the descriptive investigation based on women as a unit of analysis indicated that the ideal number of children expressed by the women differs among geographic regions (data not shown). The average ideal number of children is lowest in the regions with higher risk of unintended pregnancy and a higher risk of abortion. Specifically, the mean ideal number of children was 2.2 in the Northern Uplands, 2.1 in the Red River Delta, 2.6 in the North Central, 2.9 in the Central Coast, 4.4 in the Central Highlands, 3.3 in the South-East and 3.7 in the Mekong River Delta. This is a real message to the family planning programme officers for consideration and action, as women in some regions of Viet Nam had still expressed a desire for high level of fertility compared to the national average level (e.g. in the Central Highlands and the Mekong River Delta). Further research is needed to better understand the factors underlying these markedly different responses, as the desired number of children and ideal family size is not the focus of this paper.

The findings of the factors related to the decision of aborting the unintended pregnancies have never been mentioned in previous studies. However, some of the

relevant factors had been reported by other authors. Gorbach and others (1998) studied two communes in Viet Nam and showed that intrauterine devices (IUDs) use in the preceding year significantly lowered the likelihood of MR/abortion in the subsequent year, by 82 per cent for urban women, and 70 per cent for rural women. Use of traditional methods increased the likelihood only for rural women. Each additional year of schooling for rural women and each additional child increased the probability of menstrual regulation/abortion by 17 and 18 per cent, respectively. Ethnicity, age, and assets had no effect. In the urban communes, the probability decreased with age and was unaffected by parity, assets, or education (Gorbach and others, 1998). Do Trong Hieu and others who conducted a study in Hanoi city and Thai Binh province suggested that 50 per cent of all women (52.8 per cent in Hanoi and 47.4 in Thai Binh) had had at least one prior pregnancy termination (1.6 pregnancy terminations/woman). They also suggested that induced abortion is being used as a substitute for family planning methods. The leading reasons for not using oral contraceptives were personal health problems, unavailability, and the perception that contraceptives were bad for one's health. For IUDs, those reasons were bleeding, lumbago, headache, loss of energy and dizziness. For condoms, reasons for non-use were that they were disliked by the spouse and unavailability. Women's fear and her husband's disapproval were key reasons for not choosing sterilization (Do, Stockel and Nguyen, 1993). It is, however, important to point out that no previous study in Viet Nam compared the factors associated with the likelihood of getting on abortion or alternatively carrying to term, given that the pregnancy was unintended.

In overview, rising unintended pregnancy and abortion rates are sometimes observed concurrently with rising levels of contraceptive use. However, in transitional societies, such as Viet Nam, where demand for children is falling faster than contraceptive prevalence and use-effectiveness is rising, the widespread use of MR/abortion as a primary means of achieving family size aspirations unnecessarily puts large numbers of women at risk of adverse health outcomes. The results of this study draw some highlights for policy implications and recommendations for future family planning programmes and strategy in Viet Nam.

First of all, better supply of contraceptive methods and family planning services, which have been proven as a protective factor against unintended pregnancy and addressing the non-use/ineffective use of contraception, is still an urgent need. In combination with a better supply of methods, communication programmes geared towards different choices of modern contraceptive methods integrated with more advanced post-abortion counseling to provide more

knowledge and understanding for couples to practice modern methods, would probably reduce the risk of repeated unintended pregnancies and abortions. Male involvement in contraceptive practices should also be given high priority in the family planning programme agenda of Viet Nam. Finally, for the long-term strategy of stabilizing fertility decline and reducing the rate of abortion, it is also recommended that the Government should promote communication programmes on modern contraceptive practice at different levels: in public announcements, at health-care and family planning facilities, as well as providing sex education in schools.

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